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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/058,781	KAKIZAKI ET AL.	
	Examiner	Art Unit	
	David S. Kim	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 August 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *5,6,13-15 and 17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *5,6,13-15 and 17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Fant et al. as primary reference

3. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fant et al. (U.S. Patent No. 6,950,215 B2, hereinafter "Fant") in view of Ishikawa (U.S. Patent No. 5,859,936) and Fatehi et al. (U.S. Patent No. 6,317,255 B1, hereinafter "Fatehi").

Regarding claim 5, Fant discloses:

An optical switching system configured by multi-stage connecting a plurality of optical switching devices (e.g., Figs. 4, 6, and 7), wherein:

each optical switching device comprises a plurality of monitors with a monitoring function (e.g., notice the three stages of optical switches in Fig. 4 and their associated detectors 424, 426, 430, 434 in Fig. 4), at least one of the optical monitors being placed on a path coupling the optical switching device with one of the other optical switching devices in multistage connection (e.g., 426 on a path coupling a first stage optical switch and a second stage optical switch, 430 on a path coupling a second stage optical

switch and a third stage optical switch), and each of the monitors detecting light on a path passing through the multistage-connected optical switching devices (e.g., col. 6, l. 45-62; e.g., notice detectors 426 and 430 detecting light on a path through the multiple optical switching stages), and

each monitor comprises an optical branching circuit that separates the light of the optical signal (e.g., coupler for each of 424, 426, 430, 434 in Fig. 4); and an optical detector that monitors the light (e.g., 424, 426, 430, 434 in Fig. 4).

Fant does not expressly disclose:

wherein each optical switching device comprises a plurality of ***optical reflection*** monitors with an ***optical reflection*** monitoring function, each of the optical reflection monitors detecting ***reflected light*** on a path passing through the multistage-connected optical switching devices so as to ***locate a position of reflection*** on the path, and

each optical reflection monitor comprises an ***optical isolator*** that passes only the optical signal and blocks the reflected light; an optical branching circuit that separates the ***reflected light*** of the optical signal; and an optical detector that monitors the ***reflected light***.

Rather, Fant discloses monitoring through tapping off forward propagating light. However, it is known in the art to provide monitoring through tapping off reflected light to locate positions of reflection, as shown in Ishikawa (e.g., monitoring of reflected light in Fig. 7). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to provide the function of monitoring ***reflected light***, as shown by Ishikawa. One of ordinary skill in the art would have been motivated to do this since Fant and Ishikawa are both concerned about troubleshooting optical apparatuses with fiber optic paths (Fant, e.g., col. 7, l. 35-42, 50-65, col. 8, l. 5-14, 66 – col. 9, l. 3; Ishikawa, col. 6, l. 62 – col. 7, l. 25). Monitoring reflected light is an obvious variation for detecting problems with fiber optic paths (Ishikawa, col. 1, l. 31-35), so monitoring reflected light in the apparatus of Fant would be an obvious variation.

Additionally, the use of an optical isolator and an optical branching circuit that separates reflected light in an optical reflection monitor is known in the art, as shown by Fatehi (425 and 420 in Figs. 3-4).

At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ these components in the optical reflection monitor of Fant in view of Ishikawa. One of ordinary skill in the art would have been motivated to do this to protect against undesirable backscattering or back reflection of optical signals which may cause damage to upstream components (e.g., lasers) or which may adversely affect the operation of upstream components (Fatehi, col. 4, l. 11-17).

Regarding claim 6, claim 6 is an apparatus claim that corresponds largely to the apparatus claim 5. Therefore, the recited means in apparatus claim 5 read on the corresponding means in apparatus claim 6. Claim 6 also includes limitations absent from claim 5. These limitations are:

each optical reflection monitor comprises an ***optical circulator*** that allows the passage of the optical signal and circulates or blocks the reflected light of the optical signal, and an optical detector that monitors the reflected light.

However, Fant in view of Ishikawa and Fatehi teaches the variation of using an optical circulator in an optical reflection monitor (Fatehi, 220 in Figs. 2-3). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ such an optical circulator in the apparatus of Fant in view of Ishikawa and Fatehi. One of ordinary skill in the art would have been motivated to do this since an optical circulator also provides protection against undesirable backscattering or back reflection of optical signals which may cause damage to upstream components (e.g., lasers) or which may adversely affect the operation of upstream components (Fatehi, col. 4, l. 11-17, col. 6, l. 12-19).

4. **Claims 13-15 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fant in view of Ishikawa, as combined in the treatment of the claims above.

Regarding claim 13, Fant in view of Ishikawa discloses:

An optical switching method enabling detection of reflected light, the method comprising the steps of:

making a setting for switching an optical switching system composed of a plurality of multistage-connected optical switching devices (Fant, e.g., notice the three stages of optical switches in Fig. 4) and storing optical interconnection relationships (Fant, e.g., "settings" and "setting" in col. 7, l. 26 – col. 8, l.

14 implies knowing the optical interconnection relationships of the switches in Fig. 4 for finding locations of "malfunctioning") indicating optical paths passing through the plurality of optical switching devices (Fant, notice the path of A-B-C-D in Fig. 4; knowing the optical interconnection relationships of the switches in Fig. 4 results in knowing the various optical paths passing through the plurality of optical switching devices);

making a selection (Fant, selection implied by control of switches in Fig. 4 by controller 504 in Fig. 5;) of a circuit board on which optical switching devices are mounted according to a command from an operation control unit (Fant, controller 504 in Fig. 5) and storing optical reflection alarm information (Ishikawa, alarm information in col. 6, l. 62 – col. 7, l. 25); and

locating positions of reflection (Ishikawa, col. 7, l. 5-25) in the optical switching system according to the optical interconnection relationships (Fant, e.g., "settings" and "setting" in col. 7, l. 26 – col. 8, l. 14 implies knowing the optical interconnection relationships of the switches in Fig. 4 for finding locations of "malfunctioning") and the optical reflection alarm information being stored (Ishikawa, e.g., status signals in Fig. 7, information sent to alarm devices in col. 7, l. 1, 19),

wherein the step of storing the optical reflection alarm information includes steps of:

transferring the optical reflection alarm information from the optical switching device to the operation control unit (Ishikawa, transfer of status information to supervisory equipment in Fig. 7, such as the controller 504 in Fig. 5 of Fant);

updating the contents of the optical reflection alarm information being stored based on the optical reflection alarm information by the CPU (Ishikawa, implied by the collection of status signals for transmission to supervisory equipment, col. 7, l. 9-19).

Fant in view of Ishikawa does not expressly disclose:

wherein the step of storing the optical reflection alarm information includes steps of:

transferring the optical reflection alarm information from the optical switching device to the operation control unit ***after transmitting an optical reflection alarm acquisition***

request to the optical switching device mounted on the selected circuit board by a CPU.

However, requesting information from monitoring devices is a standard practice in the art. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to transfer the optical alarm information from the optical switching device to the operation control unit *after transmitting an optical reflection alarm acquisition request to the optical switching device mounted on the selected circuit board by a CPU.* One of ordinary skill in the art would have been motivated to do this to initiate the testing of the apparatus (Fant, e.g., col. 4, l. 30-32) so that the apparatus knows when to collect the alarm information (Ishikawa, col. 7, l. 9-19).

Regarding claim 14, claim 14 is a method claim that corresponds largely to the method claim 13. Therefore, the recited means in method claim 13 read on the corresponding means in method claim 14. Claim 14 also includes limitations absent from claim 13. These limitations are obvious under Fant in view of Ishikawa:

wherein the step of locating the positions of reflection includes steps of:

detecting an alarm position according to the optical reflection alarm information that has been stored (Ishikawa, location of the fault in col. 7, l. 5-25), when optical alarm information is present (Ishikawa, presence of the status signals in col. 7, l. 5-25);

searching the optical interconnection relationships being stored (Fant, e.g., "settings" and "setting" in col. 7, l. 26 – col. 8, l. 14 implies knowing the optical interconnection relationships of the switches in Fig. 4 for finding locations of "malfunctioning", and one would search through the optical interconnection relationships to locate the instances of "malfunctioning");

selecting a suspected abnormal optical interconnection path (Fant, e.g., "settings" and "setting" in col. 7, l. 26 – col. 8, l. 14 includes the selection of the various paths through the switch, including the path of the suspected abnormal optical interconnection path); and

after determining a rearmost connection among interconnected points at which reflected light occurs, notifying the operation control unit of the rearmost connection (Ishikawa, Fig. 7, one would not expected reflected light to be detected after the reflection location since the reflection

would indicate no further propagation of light, so notification of the reflection location would be equivalent to notification of the rearmost connection).

Regarding claim 15, Fant in view of Ishikawa discloses:

A method of collecting optical reflection alarm information in an optical switching system including a system control unit (Fant, e.g., controller 504 in Fig. 5) and a plurality of multistage-connected (Fant, e.g., notice the three stages of optical switches in Fig. 4) optical switch boards (Fant, switches in Fig. 4) each of which is provided with an optical switching unit (Fant, switches in Fig. 4), a board control unit (Fant, not shown but standard to include with each switch in Fig. 4) and a plurality of optical reflection monitors coupled to I/O ports of the optical switching unit (Ishikawa, monitoring of reflected light in Fig. 7) so that at least one of the optical reflection monitors being placed on an optical signal path coupling the optical switching unit with one of the other optical switching units in multistage connection (e.g., 426 on a path coupling a first stage optical switch and a second stage optical switch, 430 on a path coupling a second stage optical switch and a third stage optical switch), the method comprising the steps of:

performing a settings for optical path switching in each of said optical switching units and storing information indicative of optical interconnection relationships between the I/O ports into a switching information register (Fant, e.g., "settings" and "setting" in col. 7, l. 26 – col. 8, l. 14 implies knowing the optical interconnection relationships of the switches in Fig. 4 for finding locations of "malfunctioning");

determining status of an optical signal path passing through an I/O port coupled to a optical reflection monitor (Ishikawa, status signals in col. 7, l. 5-25) by comparing a monitored signal received from the selected optical reflection monitor with a predetermined threshold (Ishikawa, e.g., reference level in S11 in Fig. 4);

setting status information indicative of the status of said optical signal path into an optical reflection monitoring register (Ishikawa, port status acquisition unit in Fig. 7); and collecting said status information from each of optical switch boards by said system control unit (Ishikawa, collection of status signals for transmission to supervisory equipment, col. 7, l. 9-19).

Fant in view of Ishikawa does not expressly disclose:

performing a settings for optical path switching in each of said optical switching units and storing information indicative of optical interconnection relationships between the I/O ports into a switching information register ***by each of said switching board control units in accordance with instructions from said system control unit***;

selecting one of said optical reflection monitors one after another by each of said board control units;

determining status of an optical signal path passing through an I/O port coupled to said selected optical reflection monitor by comparing a monitored signal received from the selected optical reflection monitor with a predetermined threshold ***by said board control unit***;

setting status information indicative of the status of said optical signal path into an optical reflection monitoring register ***by said board control unit***; and collecting said status information ***from each of optical switch boards*** by said system control unit.

However, the location of various control functionality is an obvious limitation to vary. That is, Fant discloses controller 504 in Fig. 5. However, it is also standard to include board control units for each switch in Fig. 4 to process the control signals from controller 504 in Fig. 5. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to arrange the board control units to perform the control functionality highlighted above. One of ordinary skill in the art would have been motivated to do this to provide localized control for each switch, which is generally faster than a single, centralized control for all of the switches.

Moreover, "selecting one of said optical reflection monitors one after another" is just one of a number of obvious ways to poll the monitors for the monitoring information. One could also obviously select a group of the monitors at a time. One could also obviously select all of the monitors. One could also obviously select only some and not others. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to "selecting one of said optical reflection monitors one after another". One of ordinary skill in the art would have been motivated to do this to poll all of the monitors

for monitoring information to provide status information for each monitoring location to provide comprehensive status analysis of the apparatus.

Regarding claim 17, Fant in view of Ishikawa discloses:

The method according to claim 15,

wherein the status of said optical signal path is determined by comparing a monitored signal value with said threshold by said board control unit (Ishikawa, e.g., comparison in S11 of Fig. 4), and

said status information includes a "1" bit to indicate an abnormal condition when the monitored signal value was judged smaller than the threshold and a "0" bit to indicate a normal condition when the monitored signal value was judged not smaller than the threshold (Ishikawa, col. 7, l. 12-16).

Fant in view of Ishikawa does not expressly disclose:

wherein the status of said optical signal path is determined by comparing ***an A/D converted*** monitored signal value with said threshold by said board control unit, and

However, A/D conversion is standard practice in the art for processing an analog optical signal, such as the reflected light in Fig. 7 of Ishikawa. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to perform such A/D conversion. One of ordinary skill in the art would have been motivated to do this since one would expect the electrical circuitry of Fig. 7 of Ishikawa to mainly operate with digital electrical signals. That is, the electrical circuitry of Fig. 7 of Ishikawa implement various control functionality that is easier to perform with modern digital technology than with analog technology, which is generally associated with much older and bulkier circuitry.

Response to Arguments

5. Applicant's arguments, filed on 20 August 2007, have been fully considered but they are not persuasive. Applicant presents eight salient points.

Regarding the first point, Applicant states:

> "Regardless of the Examiner's contentions, the process of monitoring reflected light in Ishikawa and the Instant invention cannot be considered just an obvious variation for the apparatus of Fant. In particular, Applicants note that the structure of the instant invention differs from that of both Fant and Ishikawa. The Office Action indicates that Ishikawa discloses monitoring of reflected light and directs reference to Fig. 7 and column 6, line 62 to column 7, line 25. The cited passage, however, merely describes the fact that Ishikawa provides a port failure

> communication controller that reports the error status information to an external alarm device. Further, the beam splitter (1b) of Ishikawa includes the port failure communication controller (30) to inform external supervisory equipment of the faulty port that has been detected. This passage, however, does not address the manner in which the optical monitor is arranged and/or the manner in which it operates. Ishikawa provides a plurality of photo diodes (PDa-PDn) that serve as optical sensing devices. These photo diodes are connected to the front end circuits of the reflection detection controllers" (REMARKS, p. 9, middle paragraph).

Examiner respectfully notes that the standing rejections already recognize that "the structure of the instant invention differs from that of both Fant and Ishikawa" by employing an obviousness rejection under 35 U.S.C. 103(a). Notice that Fig. 7 shows the "monitoring of reflected light" through the "reflected light", the reflection detectors 11a-11n, and the reflection monitors 12a-12n. Also, notice that Fig. 7 shows that the reflection detectors 11a-11n and the reflection monitors 12a-12n are arranged to detect and monitor the "reflected light". Accordingly, this point is not persuasive.

Regarding the second point, Applicant states:

> "Ishikawa specifically states 'in case of trouble such as a cable break or plug disconnection, some part of the output light beam will be reflected at the fiber end face that is left open. Assume here that such a trouble has happened to the output port A, for instance. The reflected light passes through the external modulator 20A and then arrives at the photo diode PDa via the additional optical path 16A. The photo diode PDa transduces the reflected light into an electrical signal.' Clearly, the optical monitoring function is not performed by placing the optical monitors along a path that couples multiple optical switching devices in a multistage connection. This is illustrated in Figs. 1 and 7. Further, Ishikawa clearly indicates that the reflected light is only monitored after an optical cable has been broken and/or disconnected. Consequently, the system of Ishikawa is intended to detect the reflection of light that is reflected at the open end of the optical fiber cable that has either been broken or disconnected. This is to be expected, however, as one of the problems that Ishikawa intends to address is that of injury which can occur to the retina of a maintenance engineer if a fiber is broken. See column 1, lines 24-41. Consequently, the system of Ishikawa is focused on detecting reflected light which exits the broken end of the optical fiber cable." (REMARKS, p. 9-10, bridging paragraph, emphasis Applicant's).

Examiner respectfully notes that the standing rejections do not rely on Ishikawa to address "the optical monitoring function...performed by placing the optical monitors along a path that couples multiple optical switching devices in a multistage connection". Rather, the standing rejections rely on Fant for such a monitoring function (e.g., 426 on a path coupling a first stage optical switch and a second stage optical switch, 430 on a path coupling a second stage optical switch and a third stage optical switch). Additionally, Examiner respectfully notes that Ishikawa focuses on detecting reflected light that reflects from a fiber end face of a broken end of an optical fiber cable (col. 1, l. 47-49; "back reflection" in col. 1, l.

50; col. 4, l. 55-60), not "reflected light which exits the broken end of the optical fiber cable" as asserted by Applicant. Accordingly, this point is not persuasive.

Regarding the third point, Applicant states:

> "In contrast, the present invention provides an arrangement wherein the optical monitor is placed along a path coupling two optical switching devices. When there is a reflecting point in the input port 455-3-1 of CB700-3 and reflected light is monitored in the optical reflection monitors 470-1-1 and 460-1-1, a value that indicates an abnormal condition is written into the optical reflection alarm control table. See page 13, lines 17-25, and Fig. 3 of the Specification. Additionally, it can clearly be seen that the optical reflection monitors 470-2-N are provided along the path that couples multiple optical switching devices. This configuration is clearly different from that shown in any of the applied references. Since the cited references fail to disclose, or even remotely suggest, all of the features recited in independent claim 5, they cannot be construed as rendering the claimed invention obvious. More particularly, the art of record simply fails to provide any disclosure or suggestion for features recited in independent claim 1, such as:
>
> > each optical switching device comprises a plurality of optical reflection monitors with an optical reflection monitoring function, at least one of the optical monitors being placed on a path coupling the optical switching device with one of the other optical switching devices in multistage connection, and each of the optical reflection monitors detecting reflected light on a path passing through the multistage-connected optical switching devices so as to locate a position of reflection on the path, and
> >
> > each optical reflection monitor comprises an optical isolator that passes only the optical signal and blocks the reflected light; an optical branching circuit that separates the reflected light of the optical signal; and an optical detector that monitors the reflected light.
>
> It is therefore respectfully submitted that independent claim 5 is allowable over the art of record" (REMARKS, middle of p. 10 – middle of p. 11, emphasis Applicant's).

Examiner respectfully notes that Fant also teaches optical monitors "provided along the path that couples multiple optical switching devices" (e.g., notice detectors 426 and 430 detecting light on a path through the multiple optical switching stages). In view of the optical reflection monitors of Ishikawa, the standing rejections show that optical *reflection* monitors "provided along the path that couples multiple optical switching devices" would be an obvious variation of Fant. Accordingly, this point is not persuasive.

Regarding the fourth point, Applicant states:

> "Independent claim 6 defines an optical switching system that is configured by multi-stage connecting a plurality of optical switching devices. According to independent claim 6:
>
> > each optical switching device comprises a plurality of optical reflection monitors with an optical reflection monitoring function, at least one of the optical monitors being placed on a path coupling the optical switching device with one of the other optical switching devices in multistage connection, and each of the optical reflection monitors detecting reflected light on a path passing through the multistage-connected optical switching devices so as to locate a position of reflection on the path, and

> each optical reflection monitor comprises an optical circulator that allows the passage of the optical signal and circulates or blocks the reflected light of the optical signal, and an optical detector that monitors the reflected light.
>
> The optical switching system of independent claim 6 includes, in part, at least one optical monitor that is placed on a path which couples the optical switching device with another optical switching device within the multi-stage connection. See Fig. 3. As previously discussed with respect to independent claim 5, the art of record fails to provide any disclosure or suggestion for providing the optical reflection monitors along a path that couples multiple optical switching devices in the multistage connection.
>
> It is therefore respectfully submitted that independent claim 6 is allowable over the art of record" (REMARKS, middle of p. 11 – middle of p. 12).

As this point directs attention to the discussion of claim 5 (the third point above), Examiner respectfully directs attention to the response to the third point above. As the third point above is not persuasive, this fourth point is also not persuasive.

Regarding the fifth point, Applicant states:

> "Contrary to the assertions made in the Office Action, the cited references do not disclose all of the features recited in independent claim 13. As previously discussed, Ishikawa discloses an arrangement for detecting reflected light after an optical fiber has been broken and/or disconnected. Consequently, it is not possible to store optical interconnection relationships that indicate the optical paths passing through the plurality of optical switching devices" (REMARKS, top of p. 14, emphasis Applicant's).

Examiner respectfully notes that Ishikawa's "arrangement for detecting reflected light after an optical fiber has been broken and/or disconnected" does not logically prevent "storing optical interconnection relationships that indicate the optical paths passing through the plurality of optical switching devices". That is, Ishikawa's arrangement is concerned about fault detection. In contrast, the limitation of storing optical interconnection relationships is concerned about path identification. It is not clear how Ishikawa's "arrangement for detecting reflected light after an optical fiber has been broken and/or disconnected" leads to the prevention of "storing optical interconnection relationships that indicate the optical paths passing through the plurality of optical switching devices". How does a teaching about fault detection prevent a teaching about path identification?

Moreover, although Applicant emphasizes the situation of "after an optical fiber has been broken and/or disconnected", how does this situation prevent "storing optical interconnection relationships that indicate the optical paths passing through the plurality of optical switching devices"? Perhaps, this situation could prevent such "storing" if it takes place before the "storing". However, this situation does

not imply such an order of events. Furthermore, such an order of events is not required by the prior art of record or by the standing rejections. Accordingly, this point is not persuasive.

Regarding the sixth point, Applicant states:

> "Furthermore, it is not possible for the cited references to locate positions of reflection in the optical switching system according to the optical interconnection relationships and the optical reflection alarm information being stored. More particularly, the cited references fail to provide any disclosure or suggestion for features recited in independent claim 13, such as:
>
> making a setting for switching an optical switching system composed of a plurality of multistage-connected optical switching devices and storing optical interconnection relationships indicating optical paths passing through the plurality of optical switching devices;
>
> making a selection of a circuit board on which optical switching devices are mounted according to a command from an operation control unit and storing optical reflection alarm information; and
>
> locating positions of reflection in the optical switching system according to the optical interconnection relationships and the optical reflection alarm information being stored.
>
> It is therefore respectfully submitted that independent claim 13 is allowable over the art of record" (REMARKS, p. 14).

Examiner respectfully notes that the standing rejections rely on Fant for the teaching of locating faults in the optical switching system according to the optical interconnection relationships (Fant, e.g., "settings" and "setting" in col. 7, l. 26 – col. 8, l. 14 implies knowing the optical interconnection relationships of the switches in Fig. 4 for finding locations of "malfunctioning") and optical alarm information being stored (Fant, e.g., information from the detectors, col. 8, l. 57-65). The standing rejections rely on Ishikawa for the teaching of correlating positions of reflection with positions of faults (Ishikawa, col. 4, l. 55-60) and for the teaching of the alarm information (Ishikawa, alarm information in col. 6, l. 62 – col. 7, l. 25), which indicates reflection(s). Ishikawa's teachings show that locating faults can be performed by locating positions of reflection and through the use of the associated optical reflection alarm information. In view of such teachings, an obvious variant of Fant would be to "locate positions of reflection in the optical switching system according to the optical interconnection relationships and the optical reflection alarm being stored". Accordingly, this point is not persuasive.

Regarding the seventh point, Applicant states:

> "Independent claim 14 recites various steps that are somewhat similar to those recited in independent claim 13. For example, optical interconnection relationships are stored to indicate the optical paths passing through the plurality of optical switching devices. Furthermore, positions of reflection in the optical switching system are located according to the optical interconnection relationships in the optical reflection alarm information that is stored. As previously discussed, the art of record does not provide such features. Rather, the references provide an ability to detect reflected light after an optical cable has been broken or disconnected. It is therefore respectfully submitted that independent claim 14 is allowable over the art of record" (REMARKS, p. 15, middle paragraph).

Examiner respectfully notes that the standing rejections rely on Fant for the limitation of (1) "optical interconnection relationships are stored to indicate the optical paths through the plurality of optical switching devices". The standing rejections rely on Ishikawa for the limitation of (2) "optical reflection information". Together, one finds the (3) "positions of reflection". Moreover, the (4) "ability to detect reflected light after an optical cable has been broken or disconnected" does not exclude (1), (2), or (3), as similarly discussed in the treatment of the fifth point above. Accordingly, this point is not persuasive.

Regarding the eighth point, Applicant states:

> "As previously discussed, the art of record does not provide optical reflection monitors that are placed on the optical signal path coupling two optical switching units. Additionally, Ishikawa provides a reflection monitor that is intended to detect light emitting from a fiber cable that has been either broken or disconnected. Consequently, the cited references fail to provide any disclosure or suggestion for features recited in independent claim 15, such as:
>
> performing a settings for optical path switching in each of said optical switching units and storing information indicative of optical interconnection relationships between the I/O ports into a switching information register by each of said switching board control units in accordance with instructions from said system control unit;
>
> selecting one of said optical reflection monitors one after another by each of said board control units;
>
> determining status of an optical signal path passing through an I/O port coupled to said selected optical reflection monitor by comparing a monitored signal received from the selected optical reflection monitor with a predetermined threshold by said board control unit;
>
> It is therefore respectfully submitted that independent claim 15 is allowable over the art of record" (REMARKS, p. 17).

Examiner respectfully notes that Fant discloses optical monitors that are placed on the optical signal path coupling two optical switching units (e.g., 426 on a path coupling a first stage optical switch and a second stage optical switch, 430 on a path coupling a second stage optical switch and a third stage optical switch). In view of Ishikawa, these optical monitors would be optical *reflection* monitors. Additionally, "a

reflection monitor that is intended to detect light emitting from a fiber cable that has been either broken or disconnected" does not exclude the steps of claim 15, as similarly discussed in the treatment of the fifth point above. Accordingly, this point is not persuasive.

Summarily, Applicant's arguments are not persuasive. Accordingly, Examiner respectfully maintains the standing rejections.

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER